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ABSTRACT

A project was conducted to improve the state of Washington's community and technical college system by developing and using an improved occupational forecasting system to assess and respond to education and training needs. First, long-term occupational forecast data from Washington's Employment Security Department were matched with technical and community college program completion numbers to identify occupations where employer-identified labor needs were not being met or where oversupplies of workers existed. Next, the assessment results were verified through extensive employer interviews focusing on occupational demand, wages, skill requirements, hiring processes, and preferred forms of education/training. The forecasting system was used to assess labor needs in the following occupational areas: information technology; human services; purchasing and logistics management; automotive technicians; machine trades; and agriculture/agribusiness. The following were among the recommendations issued: (1) have college staff conduct regular labor market analyses; (2) develop more flexible service delivery systems; and (3) make a state-level policy commitment to direct colleges to respond to evidence of excess supply or demand by modifying the number of slots in particular programs. (The

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occupational assessment interview guide is appended, along with the labor market assessment reports for the fields of automotive technology and purchasing and logistics management technology.) (MN)

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Matching Community and Technical College Professional/Technical Education Capacity to Employer Demand

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Final Report
For
Washington State Board for Community and Technical Colleges
January 14, 2000

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Executive Summary

Study Purpose

This project provides the Washington State community/technical college system with an improved occupational forecasting system so that it can do a better and faster job of meeting employer training/education needs. The system has two parts: the first matches long term occupational forecast data from the Employment Security Department with education program completion numbers to identify occupations where demand is not being met (or where oversupply exists). The second part of the forecasting system verifies this information through extensive interviews with local employers, preferably using college faculty or staff as a means of building longer term relationships with area firms. These interviews collect detailed and up to date labor market information about occupational demand, wages, skill requirements, hiring processes, and preferred forms of training/education that enable the colleges to tailor programs responsive to current employer needs.

Major Findings

The labor market projections show that over 32,000 annual job openings will occur during the 1998-2008 time period that are likely to require some form of community/technical college level training, which includes some combination of post-secondary vocational certificates, diplomas, apprenticeships, associate's degrees, work experience, or substantial on the job training. In addition, another 17,600 annual openings will require short-term preparation, from one to 12 months. Depending on the occupational field, many people could obtain relevant training for these occupations at community and technical colleges, or alternative education providers including universities and private career colleges. Based on recent data on education program completions, the Washington State community/technical colleges system will be producing about 14,400 completers of related job preparation training programs. In other words, demand will severely outstrip supply. This is the case for most occupations for which the system provides training. For the better-paying occupations ($10.65 an hour or more), the demand-supply gap is particularly acute--300 annual openings or higher--for several types of sales and computer-related occupations, carpenters, electricians, heavy truck drivers, general secretaries, registered nurses[1], and auto mechanics. With such significant unserved need, it may be advisable to add several more workforce programs in the state rather than simply adding some seats in a few colleges. The data on education program completions may somewhat undercount certain certificate and WorkFirst programs, but even allowing for this minor under-counting, employer demand is not being met in many fields.

Conversely, the system appears to be producing more completers than are in demand in a variety of occupations, including compositors and typesetters, data processing equipment repairers, and occupational therapy assistants. The state needs to consider a number of factors in deciding how to respond to this: whether there is significant out-of-state demand that might be served; whether the projections could be too low; and whether this represents a regional or statewide imbalance.

[1] Registered nurses are also provided by four-year institutions; therefore, the demand-supply gap for this occupation is probably overstated.

Interviews conducted by several community and technical colleges as a pilot test of this forecasting system added weight to several of these conclusions. For example, Bellevue's work on information technology occupations confirms, as other studies have, the critical shortage of information technology training slots relative to the demand that exists in a wide variety of private and public business organizations. Lake Washington's work on auto technicians added considerable detail and a sense of urgency to the conclusion about a shortage of qualified maintenance and repair technicians. In addition to confirmation of trends discerned in the long term employment projections, the interview process had other benefits, including improved faculty perceptions of current conditions and technology in selected industries, recruitment of advisory committee members, feedback on service delivery methods, and generally strengthening relationships between colleges and local employers. In general, these interviews confirmed the value of combining structured interviews conducted by college faculty and staff with a targeted protocol for looking at the state's long term employment projections.

Recommendations

- The community/technical college system should implement a program of regular labor market analyses conducted by college staff. This would use a standard protocol that includes both examination of existing labor market and program completion data, and in-depth interviews with area employers in targeted industries/occupations. Results should be used to guide specific program decisions as well as systemwide shifts.
- Some SBCTC funding should be tied to these analyses, whether to support simple program expansion or the more challenging action of downsizing some programs and shifting focus to other training.
- The SBCTC should make a policy commitment to direct colleges to respond to evidence of excess supply or demand by contracting or expanding the number of program slots; scarce resources should be directed to higher demand, higher paying occupational training absent compelling social justifications.
- Given the more rapid job growth expected in urban areas, rural colleges will need to concentrate some of their resources on occupations based in urban areas.
- The colleges should conduct more outreach and marketing to regional Workforce Development Councils, economic and workforce development organizations, employers, and unions. These organizations are also focusing more intensively on local industry workforce needs and would benefit from this structured forecasting process. The protocol may have to be modified somewhat to accommodate the needs of these other consumers of labor market forecasts.

Introduction

The overall goal of this project is to improve Washington State's technical/professional training system by more closely targeting education and training resources to meet employer needs. The information system required to achieve this goal is an improved forecasting system based on both quantitative industry and occupational workforce projections, and structured discussions with employers that provide insights on changing workplace conditions and skill requirements of employers. As a first step in improving the forecasting system, we used long term occupational projections and other information provided by the Employment Security Department, and data on education program completions provided by the U.S. Department of Education and the Washington State Board for Community and Technical Colleges. In addition, seven of the community and technical colleges represented on an advisory board for the project also directly participated by conducting employer interviews in selected sectors to pilot test the recommended process for enriching long term labor market projections with direct employer input. This document summarizes the findings of the project and offers suggestions for next steps in developing an improved system of using projections and structured interviews to help guide both the level of service to different occupations and industries, and the nature of the curriculum and service delivery methods.

Analysis of Long Term Employment Forecasts

Long term employment forecasts are a key piece of any attempt to relate workforce and professional program offerings to labor market demand. For this report, a database has been compiled including occupational forecasts and data on degree and certificate completion at Washington's colleges and universities.

Data Sources

Under a federal program, Washington's Employment Security Department prepares 10 year forecasts every other year for each county in the state as well as the state as a whole. An industry forecast is prepared first, showing total employment change for each industry at roughly a 2-digit SIC level of disaggregation for the state as a whole. U.S. Department of Labor (DOL) data are then used to estimate the number of job openings in each industry due to replacement of workers who leave occupations due to retirement, career shifts, and other reasons; and the number of job openings due to expansion of total employment in an industry. These two projections at the industry level – openings due to replacement and to growth – are then used to prepare occupational forecasts. Based on occupational surveys, staffing patterns are developed for each industry using the DOL Occupational Employment System (OES) of classifying occupations. The survey data allow ESD analysts to assign proportional factors to the projected replacement and growth openings, yielding projections for over 700 specific occupations. The 1996-2006 round of long term industry and occupational projections are available for each county and the state on the ESD Wilma web site (http://www.wilma.org/). The projections used in this report are preliminary statewide projections for the period from 1998 to 2008.

Several further steps were taken in preparing the occupational forecast matrix used in this analysis. The ESD projections were supplemented with estimates of the 1997 median

wage paid to workers in each occupation (data from ESD occupational surveys), and DOL-based ratings of the minimum level of education, training, or experience required to enter each occupation (see below). The occupational forecast data were then matched to data on degree production by institutions of higher education. These data come from the State Board for Community and Technical Colleges (SBCTC), whose staff prepare these estimates both for a federal survey and for in-state policy making purposes. Data for the 1996-97 education year are available from a U.S. Department of Education web site (http://nces.ed.gov/Ipeds/c9697/) and include all postsecondary institutions. However, the 1997-98 program completion data used in this report, available from SBCTC staff, do not include completions from private career schools or 4-year institutions. Therefore, it should be kept in mind that these data may underestimate supply in certain occupations served by those institutions.

The available 1997-98 completions data are arrayed by the OES occupational field that corresponds most closely with each degree or certificate program. Advisory team members and staff at the SBCTC were consulted extensively to make the best matches between education programs and occupational fields. In a number of cases, multiple education programs are associated with particular occupations in order to make the matches as accurate as possible. In addition to these completion data for degrees and certificates, data on apprenticeship completions and completions of short term 45-hour programs were provided by the SBCTC, and these completers are also included in the database.

After discussions with the project advisory committee, occupations requiring a B.A. or graduate degree were dropped from the analysis unless programs in the community colleges offer AA degrees or certificates in the same occupation. Keeping these occupations in the analysis allows a look at possible career paths as well as competition in the marketplace between holders of B.A.s and community college degrees and certificates. In some cases employers prefer the focused technical training associated with an A.A. or certificate to the more general education provided in a typical B.A. program. However, since this report is for the community/technical colleges system and because the 1997-98 data available to the authors did not include 4-year degrees, B.A. completion data are not included in the report tables. The advisory committee also recommended that a number of occupations requiring moderate or short term on the job training be excluded from the database as highly unlikely candidates for community/technical college services (based on employer preference, on-site machinery requirements, etc.).

Occupations were coded using a system of four categories adopted by the PMCI (Performance Management for Continuous Improvement), an interagency group sponsored by the state's Workforce Training & Education Coordinating Board :

1: Occupations requiring **long preparation**, generally four years or more of academic work leading to a bachelor's degree or higher and which may require work experience in addition to the degree.

2: Occupations requiring **moderate preparation**, generally for more than one year but less than four, which may be on the job, through employer or educational institution-provided instruction, or a combination. Jobs that require apprenticeships, certificates, diplomas, or associate's degrees are included here.

3: Occupations requiring **short preparation**, generally from one to 12 months, which may be on the job, employer or institution-provided, or a combination.

4: Occupations requiring **little preparation**, generally less than one month of training, usually obtained on the job.

The community and technical colleges primarily serve occupations in codes 2 and 3.

Analytic Methods

By adding up the number of completions at all levels from short term training and certificate programs up through A.A. degrees, and apprenticeships, a measure of Washington-educated supply of workers is created. This in-state supply can then be compared to the occupational demand projections to get a sense of the balance between supply and demand of workers by occupational field. Of course, workers educated or trained at colleges in Washington will never represent 100 percent of the labor force. Workers move into this state from other places seeking employment, and companies often recruit outside the state to enhance the diversity of their workforce's backgrounds and broaden their networks to companies in other regions. However, if locally educated supply and local demand are roughly equal, then local residents should have better odds of finding a job in their chosen fields than if supply is not matched to demand. In cases where supply is much greater or much lower than demand, the community and technical colleges should be responding appropriately to market signals and adjusting FTEs in programs. This supply-demand comparison is a central feature of the occupational forecast analysis reported below.

Wages earned in particular occupations are also of interest to policymakers, future workers considering investments in education and training, and employers. We have used the findings from the Northwest Policy Center's Job Gap Study to ascertain whether occupations are likely to provide a living wage to workers. The 1998 living wage level for a single person in Washington is estimated at $10.65/hour, and at higher levels for larger households with a single worker. In the analyses reported below, some tables provide information on the number of projected job openings that meet this criterion wage level.

Because the occupational forecasts are provided by ESD at a county level, it is possible to aggregate the counties in ways that reflect the service districts for particular colleges, or the welfare system, or economists' conceptions of effective regional labor markets or other regions. As noted above, the county level projections for all occupations for 1996-06 are currently available on the ESD website; within a few months the 1998-08

statewide projections used in this report should also be available from the website, or from the authors for the particular occupations included in this analysis.

Results of the Occupational Forecast Analysis

The projected job openings can be compared to the supply of potential workers coming out of the state's community/technical colleges, vocational schools, and apprentice programs. Arraying the total statewide degree, certificate, and apprentice completions by occupational field up against projected openings reveals that supply is markedly less than demand overall and in most occupational areas. Overall, the state economy is projected to have close to 50,000 openings per year from 1998 to 2008 in the occupations served by the community and technical colleges, but the colleges are currently graduating only about 14,400 persons in fields coded within these clusters. About 32,000 of these jobs require some combination of post-secondary vocational certificates, diplomas, apprenticeships, associate's degrees, work experience, or substantial on the job training; the remaining 17,600 typically require 1-12 months of training. In addition, there are another 46,000 projected annual openings in jobs that require relatively little training; however, there are colleges that do spot training even for some of these jobs, based on local employer requests.

Either existing labor force members with relevant skills will switch career fields to meet this demand, or employers will have to search among emigrants and potential emigrants to the state to meet the demand. Another alternative is that firms will modify their production processes or business methods to achieve a perhaps lower quality or more expensive set of products and services with a labor force that is not optimal from a skills point of view. This overall result suggests that investments to expand the capacity of the workforce education system in Washington would yield benefits to employers, who would be able to hire qualified staff more easily, and benefits to workers who would see larger paychecks as they upgraded their skills in fields where there are currently unmet demands.

Analysts familiar with the education program completion data suggest that a few certificate programs and some WorkFirst programs are not currently included in the completions data. Thus, completions in a few fields are under-counted, but these errors in the currently available data do not offset the general conclusion that demand outstrips supply in most fields, and the instances of excess supply are relatively few.

The occupational forecasts can be sorted several different ways to provide alternative views of the statewide labor market. The next several tables provide some interesting findings based on sorting the forecasts by the balance between the number of completers and the number of openings, by wages, or some combination of the two.

Table 1 shows the 25 occupations with the largest demand/supply gaps. If one of the primary goals of the community and technical colleges is simply to meet employer demand, these 25 occupations are important ones to consider. Computer support (presented as a cluster of related occupations), sale-related occupations, carpenters,

secretarial and other clerical occupations, and teacher aides top the list. In some of these high demand fields, the community and technical college system has existing programs but their capacity is well under projected employer demand, e.g., computer support and carpentry. In other fields, such as the sales related occupations, the public education system does not play much of a role currently. In a number of fields shown in this table, wages are rather low, including teacher aides, hairdressers, food preparation and service, telemarketing, and general service jobs. The colleges offer both degree and non-degree programs in some of these fields, although they are generally more active within the higher wage fields.

Table 2 shows a number of occupations which are labeled as typically requiring less than a month of training, but which are currently being served by some of the community/technical colleges. As might be expected, this table includes a higher number of low wage jobs, including retail sales, child care workers, and guards. One implication for the college system from these tables is that programs aimed at low wage jobs should be re-examined. Possible rationales for continuing with such programs include compelling social needs, an argument often advanced for child care; fields that provide job opportunities for people with limited education and learning disabilities; or careers with particular cultural value to a certain group.

Another view of the labor market is provided by sorting the occupational matrix by wage level, looking at the 25 highest wage occupations (see Table 3). If one key goal of the community and technical college system is to help students advance economically, these occupations are worth considering. In general, the number of projected openings in these high wage occupations is rather small, although a substantial number of openings is projected for the computer support cluster, dental hygienists, supervisors in service fields, vocational education teachers, scientific sales representatives, and police patrol officers. Demand is greater than the locally educated supply in all of these fields, which suggests good labor market conditions for qualified applicants. Some of the computer cluster occupations may require higher education degrees, but many do not. Few specific programs are targeted at these high-wage occupations, indicating that there may be some niche market opportunities the colleges could capitalize on. Fields such as scientific equipment sales and vocational education instruction could be added to the college system's array of professional/workforce programs.

Table 4 provides a third view of the labor market: the 25 occupations with the largest number of projected openings and which pay at least $10.65 per hour, a pay level estimated to be a living wage in 1998 in the Northwest Policy Center's *Northwest Job Gap Study*. The table indicates indirectly that that there are specific college programs aimed at most of these occupations because the "Demand – Supply" column shows smaller numbers than the "Projected Annual Openings." This difference implies that the college system is sending trained completers out into the job market in these fields. The community and technical college system has clearly focused its offerings on the "best bets"—those occupations with a reasonably high number of openings and a wage level that rewards the investment in education. In many of these fields, there is substantial

Table 1: CTC-Relevant Occupations with the Largest Gap between Demand and Supply

OES Occupational Title	1998 Employment	Projected Annual Openings	Education Level to Enter Occup.	Hourly Wage	Demand - Supply Gap
Computer Support Cluster*	39,404	3,336	Long to moderate*	$19.89*	2,472
Marketing/Sales Supervisors	54,673	1,806	Moderate	$13.36	1,804
Carpenters	42,276	1,282	Moderate	$17.95	1,040
Sales Representatives, NEC	26,801	969	Short	$17.03	969
Service Supervisors, NEC	19,801	882	Moderate	$23.86	882
Secretaries, Ex Legal or Med	49,180	1,093	Moderate	$11.28	850
Teacher Aides, Paraprof	19,991	746	Moderate	$9.37	746
Clerical Supervisors	28,129	1,230	Moderate	$13.38	743
*Hairdressers & Hairstylists***	*17,543*	*637*	*Moderate*	*$6.78*	*620*
Cooks, Restaurant	17,876	892	Moderate	$8.24	607
Automotive Mechanics	19,882	998	Moderate	$14.12	570
Sales Reps, Science	12,036	546	Short	$20.67	546
Painters & Paperhangers	13,947	564	Short	$14.06	507
Sales & Related Workrs	11,962	540	Short	$13.20	482
Instructors & Coaches, Sports	8,968	480	Short	$11.03	480
Bookkpng, Accntng, Audit Clks	60,761	1,025	Short	$11.06	428
Electricians	17,243	518	Moderate	$20.05	422
Telemktrs, Door-To-Door Sales	10,305	419	Short	$7.95	419
Registered Nurses***	39,328	1,211	Moderate	$19.87	352
Salespersons, Parts	7,915	364	Short	$11.53	340
Service Workers, NEC	7,680	323	Moderate	$8.51	323
Correction Officers	4,754	299	Moderate	$15.52	299
Cooks, Institution/Cafe	7,064	288	Moderate	$9.28	288
Flight Attendants	4,220	269	Moderate	$17.85	269
*Dental Assistants***	*7,543*	*509*	*Short*	*$12.32*	*267*

**It should be noted that in most tables, computer-related occupations will be grouped into a single cluster rather than presented as individual occupations, because of the particularly poor match between specific occupations and specific training program titles in this occupational cluster. The computer cluster wage is a weighted median wage for all the occupations included in that cluster.*

***When private school completions from 1996-97 are added, the totals suggest that these two occupations--hairdressers and dental assistants--may actually represent oversupply. 1997-98 private school completion data are not currently available.*

**** Registered nurses are also provided by four-year institutions; therefore, the demand-supply gap for this occupation is probably overstated.*

Table 2: Occupations with CTC Programs but Requiring Little Training

OES Occupational Title	1998 Employment	Projected Annual Openings	Hourly Wage	Completions
Salespersons, Retail	97,677	4,882	$7.88	57
Reception/Information Clks	31,132	1,469	$8.90	14
Farm Wkrs, Food & Fiber Crops	41,764	1,153	$6.37	13
Truck Drivers, Heavy	37,321	1,156	$14.35	194
Child Care Workers	25,631	1,173	$6.78	351
Laborers, Landscp/Groundskeep	15,094	617	$9.74	48
Guards	13,208	539	$7.87	20
Bank Tellers	10,367	463	$8.27	11
Protect Service Occs, NEC	3,856	348	$12.49	12
Agric,Forest,Fishng Wkrs, NEC	9,215	359	$9.09	61
Fishers/Hunters/Trappers	6,480	173	*not available*	19
Order Clerks: Materials, Service	5,598	161	$10.64	9
Electrical/Electronic Assemb	3,308	169	$9.09	42
Library Assists/Bookmobile	2,555	174	$9.27	48
Forest & Conservation Wkrs	1,921	66	$10.81	6
Fallers & Buckers	2,224	67	$20.71	12
Health Service Wkrs, NEC	4,783	228	$10.83	207
Seamen, Able	313	12	$11.75	5
Travel Clerks	388	10	$8.35	7
Veterinary Assistants	924	38	$7.24	38
Timber Cutting Workers, NEC	369	11	$14.74	12
Municipal Clerks	381	10	$15.17	15
Solderers & Brazers	108	5	$7.24	13
Motor Vehicle Operators, NEC	399	7	$11.20	20
Pruners	2,870	71	$11.61	102

No reliable data on supply are available for these occupations.

Table 3: The 25 CTC-Relevant Occupations Paying the Highest Wages

OES Occupational Title	1998 Employment	Projected Annual Openings	Preparation to Enter Occupation	Hourly Wage	Demand - Supply Gap
Computer Support Cluster	39,404	3,336	Long to moderate	$19.89	2,472
Dental Hygienists	4,407	364	Moderate	$29.18	264
Service Supervisors, NEC	19,801	882	Moderate	$23.86	882
Police Detectives	682	37	Moderate	$23.86	-16
Longshore Equipment Opers	981	22	Short	$23.45	22
Sheriffs & Deputy Sheriffs	1,438	52	Moderate	$22.50	52
Main Line Station Engineers	3	0	Short	$22.27	0
Fire Fightng/Prevent Supervrs	1,283	59	Moderate	$22.25	-21
Fire Inspectors	200	12	Moderate	$22.25	12
Elevator Installers & Repairers	528	18	Moderate	$22.16	18
Brokers, Real Estate	2,287	67	Moderate	$22.01	67
Air Traffic Controllers	755	27	Moderate	$21.90	26
Power, Substation, Electric	25	1	Moderate	$21.70	-10
Power Distributrs & Dispatchers	420	13	Moderate	$21.32	13
Petroleum Refinery Operators	211	5	Moderate	$20.94	5
Teachers & Instructors, VocED	6,982	219	Moderate	$20.84	219
Sales Reps, Science	12,036	546	Short	$20.67	546
Drywall Installers	4,109	167	Short	$20.64	167
Nuclear Med Technologists	192	6	Moderate	$20.61	4
Ship Pilots	4	0	Moderate	$20.59	0
Mach Mechanics: Water/Power	559	23	Moderate	$20.57	23
Tapers	3,455	138	Short	$20.49	138
Structural Metal Workers	970	37	Moderate	$20.49	19
Police Patrol Officers	6,548	419	Moderate	$20.48	214
Aircraft Mechanics	4,055	95	Moderate	$20.37	10

Table 4: CTC Relevant Occupations with the Most Openings and Paying a Living Wage

OES Occupational Title	1998 Employment	Projected Annual Openings	Education Level to Enter Occup.	Hourly Wage	Demand - Supply Gap
Computer Support Cluster	39,404	3,336	Long to moderate	$19.89	2,472
Marketing/Sales Supervisors	54,673	1,806	Moderate	$13.36	1,804
Carpenters	42,276	1,282	Moderate	$17.95	1,040
Clerical Supervisors	28,129	1,230	Moderate	$13.38	743
Registered Nurses*	39,328	1,211	Moderate	$19.87	352
Secretaries, Ex Legal or Med	49,180	1,093	Moderate	$11.28	850
Bookkpng, Accntng, Audit Clks	60,781	1,025	Short	$11.06	428
Automotive Mechanics	19,882	998	Moderate	$14.12	570
Sales Representatives, NEC	26,801	969	Short	$17.03	969
Service Supervisors, NEC	19,801	882	Moderate	$23.86	882
Painters & Paperhangers	13,947	564	Short	$14.06	507
Sales Reps, Science	12,036	546	Short	$20.67	546
Sales & Related Workrs	11,962	540	Short	$13.20	482
Electricians	17,243	518	Moderate	$20.05	422
Dental Assistants	7,543	509	Short	$12.32	267
Instructors & Coaches, Sports	8,968	480	Short	$11.03	480
Health Prof/Paraprof/Techns, NEC	10,535	444	Moderate	$15.76	172
Licensed Practical Nurses	10,363	432	Moderate	$13.11	35
Police Patrol Officers	6,548	419	Moderate	$20.48	214
Dental Hygienists	4,407	364	Moderate	$29.18	264
Salespersons, Parts	7,915	364	Short	$11.53	340
Automotive Body Repairers	6,372	343	Moderate	$14.48	219
Electrical & Electronic Techns	9,213	313	Moderate	$14.18	16
Fire Fighters	5,580	311	Moderate	$19.41	212
Welders & Cutters	7,309	309	Moderate	$12.97	102

**Registered nurses are also provided by four-year institutions; therefore, the demand-supply gap for this occupation is probably overstated*

unmet demand, ranging from several hundred to several thousand more projected openings than the community and technical college system is supplying. The system can do a better job of meeting employer and jobseeker needs by expanding its programs in these fields, and by adding programs in those fields where none exist such as certain sales fields.

Table 5: Top 10 Occupations at Each Education Level

OES Occupational Title	1998 Employment	Projected Annual Openings	Education Level to Enter Occup.	Hourly Wage	Demand - Supply Gap
Occupations Requiring Long Preparation					
Computer Support Cluster	39,404	3,336	Long to Moderate	$19.89	n/a
Prof, Paraprof, Techns, NEC	23,990	1,122	Long	$16.25	n/a
Designers, Ex Interior	9,911	502	Long	$13.79	n/a
Mgmt Support Workers, NEC	19,222	498	Long	$16.17	n/a
Social Workers, Exc Med, Psych	9,941	456	Long	$16.30	n/a
Social Workers, Med & Psyc	7,606	413	Long	$15.17	n/a
Artists/Commercial Artists	7,776	399	Long	$11.40	n/a
Personnel/Train/Lab Rel Specs	7,377	345	Long	$15.38	n/a
Residential Counselors	4,736	292	Long	$9.08	n/a
Recreation Workers	4,051	278	Long	$8.44	n/a
Occupations Requiring Moderate Preparation					
Marketing/Sales Supervisors	54,673	1,806	Moderate	$13.36	1,804
Carpenters	42,276	1,282	Moderate	$17.95	1,040
Clerical Supervisors	28,129	1,230	Moderate	$13.38	743
Registered Nurses***	39,328	1,211	Moderate	$19.87	352
Secretaries, Ex Legal or Med	49,180	1,093	Moderate	$11.28	850
Automotive Mechanics	19,882	998	Moderate	$14.12	570
Cooks, Restaurant	17,876	892	Moderate	$8.24	607
Service Supervisors, NEC	19,801	882	Moderate	$23.86	882
Teacher Aides, Paraprof	19,991	746	Moderate	$9.37	746
Hairdressers & Hairstylists*	17,543	637	Moderate	$6.78	620
Occupations Requiring Short Preparation					
Bookkpng, Accntng, Audit Clks	60,781	1,025	Short	$11.06	428
Sales Representatives, NEC	26,801	969	Short	$17.03	969
Painters & Paperhangers	13,947	564	Short	$14.06	507
Sales Reps, Science	12,036	546	Short	$20.67	546
Sales & Related Workrs	11,962	540	Short	$13.20	482
Dental Assistants*	7,543	509	Short	$12.32	267
Instructors & Coaches, Sports	8,968	480	Short	$11.03	480
Medical Assistants	4,929	419	Short	$9.93	188
Telemktrs, Door-To-Door Sales	10,305	419	Short	$7.95	419
Salespersons, Parts	7,915	364	Short	$11.53	340
Occupations Requiring Little Preparation					
Salespersons, Retail	97,677	4,882	Little	$7.88	*Unknown***
Cashiers	61,164	3,815	Little	$7.33	
Comb Food Prep/Serv Wkrs	44,768	3,307	Little	$5.51	
Waiters & Waitresses	42,370	2,958	Little	$5.43	
General Office Clerks	71,057	2,281	Little	$9.73	
Food Preparation Workers	25,086	2,034	Little	$6.90	
Reception/Information Clks	31,132	1,469	Little	$8.90	
Janitors & Cleaners	39,945	1,351	Little	$8.13	
Maintenance Repairers, Gen Util	28,928	1,191	Little	$12.17	
Child Care Workers	25,631	1,173	Little	$6.78	

**1996-97 private school completion data suggest that these two occupations--hairdressers and dental assistants--may actually represent oversupply. 1997-98 private school completion data are not currently available.*

***Data on supply for occupations that require little training are not available; thus,gap estimation cannot be done.*

**** Registered nurses are also provided by four-year institutions; this gap is thus overstated.*

As public organizations, the community and technical colleges are responsible for providing opportunities for students of many different levels of achievement and capacity for higher education. Table 5 breaks out the occupational projections by required education level, showing the 10 highest demand occupations at each level. These occupations may represent the best job opportunities for students at different achievement and capacity levels. The first group of fields included in Table 5 indicates that four or more years of education are required to enter these occupations at the highest levels. These occupations were included in the analysis because there are also AA or certificate programs in the same field, indicating possible career ladders for students who can continue their education. However, no supply-demand gap estimates are provided for these fields because the B.A. level completions data were not available at the time of writing.

The computer support field tops the list in this first group. Not only is the cluster one with a substantial imbalance between demand and supply, but these are fields that can be entered with a variety of levels of education, particularly at a time when there are many more openings than the state's education system can fill. Students face choices between extending their education, and moving into the labor market with a certificate or two year degree rather than a baccalaureate degree. The data presented in this report do not indicate the differences in career paths that result from entering the labor force with a certificate or two year or 4 year degree. A 1998 *Washington Software Alliance* employer survey suggests that community/technical college-level training may be particularly useful for quality assurance analysts, web developers, and helpdesk technicians. However, this is a cluster that requires further research to examine these requirements in detail.

Dropping down to the fields the community and technical colleges traditionally serve, education codes 2 and 3, there are specific programs at the colleges in most of these fields, and there is substantial excess demand in all of these fields, indicating that many of these programs could be expanded by several hundred in most cases and up to 1,800 in one field (marketing/sales supervisors). Most of these occupations pay over $10.65 per hour, indicating that they pass one test of being "living wage" occupations.

A basic concern motivating this work is achieving a better balance between the demand for workers in the labor market and the supply educated in-state at the community and technical colleges. The next three tables demonstrate possible uses of the forecast data to achieve this policy goal. Table 6 shows those occupations requiring moderate- or short-term preparation and which have more projected openings than in-state completers. The education programs supplying completers in these fields may be candidates for expansion. All of these occupations in this table pay relatively high wages, making them particularly attractive to potential job seekers. Some of these fields are in fact the subject of special industry studies conducted by community colleges as part of this study, e.g., computer support and automotive technicians. Others have been suggested as priority areas in discussions of skill gaps at the Workforce Training & Education Coordinating Board, e.g., construction-related occupations such as carpenters and painters. Other occupations included in this table have not been the focus of community or technical

college programs, e.g., sales related occupations. These may be fields where other training providers can better meet employer needs.

Table 6: CTC-Relevant Occupations Paying a Living Wage and with at least 200 More Openings than Completions

OES Occupational Title	1998 Employment	Projected Annual Openings	Education Level to Enter Occup.	Hourly Wage	Demand - Supply Gap
Computer Support Cluster	39,404	3,336	Long to Moderate	$19.89	2,472
Marketing/Sales Supervisors	54,673	1,806	Moderate	$13.36	1,804
Carpenters	42,276	1,282	Moderate	$17.95	1,040
Sales Representatives, NEC	26,801	969	Moderate	$17.03	969
Service Supervisors, NEC	19,801	882	Moderate	$23.86	882
Secretaries, Ex Legal or Med	49,180	1,093	Moderate	$11.28	850
Clerical Supervisors	28,129	1,230	Moderate	$13.38	743
Automotive Mechanics	19,882	998	Moderate	$14.12	570
Sales Reps, Science	12,036	546	Little	$20.67	546
Painters & Paperhangers	13,947	564	Little	$14.06	507
Sales & Related Workrs	11,962	540	Little	$13.20	482
Instructors & Coaches, Sports	8,968	480	Little	$11.03	480
Bookkpng, Accntng, Audit Clks	60,781	1,025	Little	$11.06	428
Electricians	17,243	518	Moderate	$20.05	422
Registered Nurses*	39,328	1,211	Moderate	$19.87	352
Salespersons, Parts	7,915	364	Moderate	$11.53	340
Correction Officers	4,754	299	Moderate	$15.52	299
Flight Attendants	4,220	269	Moderate	$17.85	269
Dental Assistants**	7,543	509	Moderate	$12.32	267
Dental Hygienists	4,407	364	Moderate	$29.18	264
Sales Agents, Business	6,390	262	Moderate	$14.71	262
Instructors, Adult (Non-VocEd)	9,680	247	Moderate	$14.46	247
Bus Drivers, Ex School	6,661	235	Moderate	$14.31	235
Teachers & Instructors, VocED	6,982	219	Moderate	$20.84	219
Automotive Body Repairers	6,372	343	Moderate	$14.48	219
Police Patrol Officers	6,548	419	Moderate	$20.48	214
Fire Fighters	5,580	311	Moderate	$19.41	212

**Registered nurses are also provided by four-year institutions; this gap is thus overstated.*

***1996-97 private school completion data suggest that dental assistants may actually represent oversupply. 1997-98 private school completion data are not currently available.*

Table 7 shows the occupations requiring moderate- or short-term preparation and which have more projected completers than in-state openings. The education programs training students in these fields may be candidates for downsizing. Some occupations in this table are the focus of long term structural or cyclical changes in the economy and careful attention to curriculum content is needed in addition to re-thinking the number of student slots the system offers. An example is compositors and typesetters, an occupation in which new electronic prepress systems are displacing older technologies. Questions the Board could ask colleges about these occupations include:

Table 7: CTC-Relevant Occupations with More Completions than Openings

OES Occupational Title	1998 Employment	Projected Annual Openings	Education Level to Enter Occup.	Hourly Wage	Demand - Supply Gap
Compositors & Typesetters	136	2	Moderate	$10.82	-143
Data Processing Equipment Repairers	1,148	86	Moderate	$14.18	-59
Occup Therapy Assistants	199	15	Little	$14.25	-48
Surgical Technologists	833	33	Moderate	$13.76	-37
Gas Appliance Repairers	39	2	Moderate	$14.59	-23
Radio Operators	74	3	Little	$11.07	-21
Fire Fightng/Prevention Supervrs	1,283	59	Moderate	$22.25	-21
Police Detectives	682	37	Moderate	$23.86	-16
EKG Technicians	193	4	Little	$12.28	-11
Electroneurodiagnostic Techns	134	6	Little	$15.22	-10
Power, Substation, Electric	25	1	Moderate	$21.70	-10
Radiation Therapists	209	4	Moderate	$16.91	-8
Legal Secretaries	4,672	132	Moderate	$14.34	-6

- Is there out of state demand in several health care fields where excess supply is projected, or reason to think that the Employment Security projections are too low?

- Is this a regional imbalance or one that exists statewide?

The final table shows occupational fields that are mainly served by private career schools (Table 8). When planning the future of the community and technical college system, the capacity of these schools should be taken into account. If private providers are providing adequate coverage of some fields such as cosmetologists and dental assistants, then the publicly-funded system can devote its scarce resources to other career fields.

Table 8: Top 20 Fields for Private Career Schools

Education Program	Completions
General Office/Clerical & Typing Services	1,824
Air Transportation Workers, Other	756
Massage	577
Cosmetologist	531
Medical Assistant	343
Computer and Information Sciences, Other	198
Electrical & Electronic Engin.-Rel. Tech	169
Dental Assistant	166
Business Administration & Mgmt., Other	161
Drafting, General	146
Cosmetic Services, Other	130
Design and Visual Communications	130
Diver (Professional)	127
Administrative Assistant/Secretarial Science	104
Pharmacy Technician/Assistant	101
Visual and Performing Arts, Other	85
Floristry Marketing Operations	61
Desktop Publishing Equipment Operator	57
Interior Design	56
Make-Up Artist	50

Summary of Community and Technical College Labor Market Studies

Seven community and technical colleges agreed to conduct local labor market studies to pilot test the employer interview protocol developed for this project. This section provides a summary of the major findings and recommendations of each college's contribution. The selection of an industry/occupation focus by each college was based on evidence of a demand-supply gap identified in the occupational forecast/program graduate data analysis in the first phase of this study, combined with the knowledge of college staff about conditions in the local economy.

Given both the size of the overall demand-supply gap estimated by available data (32,000 annual openings for community/technical college level jobs with an additional 17,600 openings requiring short-term training, compared to 14,400 annual program completers), as well as the substantial gaps for specific living wage CTC-relevant occupations such as computer support and automotive technicians, these colleges were able to select from a rich field of underserved occupations. Indeed, with a very few exceptions of occupational oversupply such as compositors and typesetters, the demand-supply gap is so widespread that individual colleges can select occupations to target based on specific local conditions and resources; significant demand-supply gaps exist in virtually all major occupational categories: management and supervision, sales, clerical, service, professional/technical, and production/repair/operation/construction. In addition, based on such specialized local knowledge, several of the colleges targeted occupational clusters not well described by the standardized data, e.g., purchasing and logistics management, thus advancing knowledge of emerging occupations and skills sets.

Common themes among these studies include the need for:

- education/training offerings that are scheduled outside of regular work hours or are available through distance learning modes
- trainings that are organized into short modules that could be combined into a certificate or degree when appropriate
- courses that are based directly upon current industry skill requirements
- more outreach and marketing by the colleges so that more area employers are aware of college-based training opportunities.

Bellevue—Information Technology

- Supply is not keeping pace with demand and to remain viable, the education institutions have to expand
- Occupations as defined by industry do not mesh with the OES occupational definitions; BCC's work is built around industry defined skill standards for five

occupations (programmer/software engineer, web design, digital media, network technician, and technical support)
- More off-hour and short-duration programs are needed
- College courses should map to industry certifications
- State Board should count industry certifications as completers
- Curriculum should be strengthened around interpersonal, customer service, technical support, technical project management, continuous learning, solving problems, and writing
- Database, digital media and e-commerce are growth areas
- Specific analyses provided for database administrator, digital media, web specialist, programmer/software engineer, technical support, and network/data communication specialist

Clark--Manufacturing Technology (e.g., semiconductor manufacturing)

- Offer courses at times meeting needs of non-traditional working students
- Offer courses in short-term modular formats
- Offer distance education on-line
- Provide certificate as well as degree programs
- More work-based learning opportunities
- Conduct more outreach and marketing
- Recognize labor market in adjoining Portland area and include needs of those employers

Edmonds—Human Services

- Employers are aware of the college's human services programs but require BAs for some occupations and provide OJT for certain minimal skill positions
- Industry driven AA degrees are preferred to BAs in certain fields such as activity director, employment services, and some rehabilitation fields
- Pay scales and limited career ladders create recruitment and retention problems in some occupations
- College should develop additional skill standards and identify career ladders to create a more professional image for certain occupations and the college's programs
- Work toward better articulation of courses, certificates, AAs and BAs

Green River—Purchasing and Logistics Management

- Many Kent Valley employers do not know about the education and training services the college offers, and to not look to the college for training or for recruiting employees
- Employers prefer courses during non-traditional hours – after 4pm or on weekends
- If the college revitalizes the transportation program, it should be re-named "Logistics Management" and courses should be offered in the evening, weekends, or by distance

education; it should be based on National Transportation Board skill standards, and should be modularized through several NTB certificate

- Purchasing Management is needed in the area, again using non-traditional hours and modular certificates that add up to a degree

Lake Washington—Automotive Technicians

- Demand for technicians is high; several respondents say it is "critical," and that it is hard to find qualified candidates who have electronic and computer skills, diagnostic abilities, etc.
- Wages range from $6.50 to 20+/hr.
- School to work programs are an important source of new hires, along with ads in various media
- Vendor and factory training supplement OJT once hired; CTCs do not seem to be a source of continuing training but workers are encouraged to continue their education
- Lake Washington has a partnership with 4 dealerships; 8 students will do their lab work at a dealership and work 4 more hours per day; they will be paid for all time at the dealership; a portion of the pay is withheld pending graduation and if they quit school they also loose the dealership job
- Lake Washington is pursing additional industry certifications and relationships, including a 12 week program with 6 weeks at school and 6 weeks at dealerships
- College has set up articulation agreements with high school auto programs
- Program needs to be marketed more, with both ads and increased advisory committee membership (2 people added to committee as a result of this study)

Shoreline—Machine Trades

- Demand for entry level workers is weak currently, and adequate applicants are found through referrals and newspaper ads; highly skilled workers are still in demand
- Specialized skills that give jobseekers an edge include tooling, CNC machining, geometric dimensioning and tolerancing
- Few shops have formal tests for applicants and rely on observing performance after hiring
- Focus of program should be on training and retraining current employees for the present due to weak demand

Wenatchee Valley—Agriculture and Agri-business

- Improved technology in all areas of fruit industry requires more technical skills, and ability to read and write
- Internships or other "hands on" experience just as important as formal education
- People skills and work ethic are of utmost importance; technical skills are required for specific positions
- Finding applicants is not difficult except for certain "niche" positions

Recommended Labor Market Analysis System

The system we recommend for use by the community and technical college system is modeled after the research process used in this project.

1. Prepare an overall supply/demand analysis using the latest long term occupational forecast from ESD, incorporating projected annual openings by occupation and matched education program completions data. This analysis should use the OES/CIP crosswalk model created for this study, in which occupational titles were matched as accurately as possible with program graduate categories. The analysts preparing these forecasts should highlight occupations with high levels of excess demand and those that pay at least a living wage, and occupations with excess supply at any wage level.

2. Conduct detailed labor market analyses in partnership with colleges that wish to participate in examining particular occupations with excess demand or supply. These analyses should be conducted using the labor market interview guide on the following pages. College staff working on these analyses should feel free to augment the interview guide to tailor the investigation to particular industries, occupations, or policy questions the colleges and the state board wish to highlight.

   Several additional points should be kept in mind in carrying out the labor market studies:

   - Allow participating colleges flexibility in deciding how to carry out the investigation. Some colleges in the current "pilot scale" studies used central administration staff or a consultant hired by central administration; other colleges called on faculty in relevant departments to carry out the work. One college contracted with an experienced Employment Security Department area economist. All of these approaches produced interesting findings, but it is notable that the colleges that relied on existing faculty often got ancillary benefits from the exercise, such as new insights about technology changes in the workplace with implications for the curriculum, or recruitment of advisory board members. Thus, direct involvement of faculty is a slightly preferred method.

   - Direct workplace interviews and focus group discussions are preferred methods of carrying out the research. Telephone interviews can also be quite successful, although results may vary more through this mode. Survey research, particularly by mail, is unlikely to yield the depth or richness of results obtained by directly speaking with employers. In a direct conversation with an employer or group of employers, follow-on questions can be used to probe particularly interesting or vague responses, yielding much more information than a simple survey question that has to be asked in exactly the same way of each respondent. In some cases, surveys can augment visits and ensure that the findings are representative of an

industry, but direct site visits or individual interviews are essential to achieve a thorough understanding of employer issues.

- Occupational forecasts and education program completion data use occupational and education program taxonomies of jobs and fields of study that may seem inappropriate or out-of-date. People carrying out investigations with employers will face the challenge of working back and forth between employers' ways of dividing up job categories and those used by forecasters and educators. The discrepancies between these systems is especially great in rapidly changing fields such as information technology. All analysts can do is work on cross-walks to relate one taxonomy to another. Very useful information to guide decisions of this nature can be obtained from direct conversations with employers about the skills required to be successful in a particular type of job. In fact, the best approach in these situations of rapidly changing workplaces is to develop skill standards for emerging occupations and revise them as necessary in partnership with interested companies.

3. Tie resource allocation decisions to the results of the projection exercise to reinforce the importance of moving the capacity of the technical/professional education system as a whole in the direction of meeting employer demands and steering students towards fields that are likely to yield living wage job opportunities.

Overall Recommendations

1. Implement a program of regular labor market analyses conducted by college staff. Analyses should be conducted by faculty or central administrative staff as each college sees fit, and the SBCTC should provide funding to encourage quality performance of this task. Colleges should be directed to conduct a limited number of labor market analyses each year, focusing on programs either they or the SBCTC think need review and possible revision, expansion, or contraction. These analyses will include examination of ESD forecasts, degree completions data, and conversations with local employers, employer associations, unions, and other community sources of expertise about trends in industry markets and labor requirements. The SBCTC should provide a protocol to guide these analyses, and a standing committee of participating staff or faculty from the colleges and the SBCTC should regularly improve the protocol and consider implications of the analyses for the college system as a whole.

2. Some SBCTC funding for education programs should be tied to the labor market analyses. Colleges wishing to expand certain programs should provide evidence supporting the expansion from their labor market work, and colleges wishing to drop or downscale certain programs could be eligible for adjustment funds to shift their focus to other areas based on the results of labor market studies.

3. Many of the pilot studies suggest a need for more flexible service delivery systems including expansion of offerings in the evenings and weekends, and using the Internet or other distance education technologies. Several studies mentioned employer preferences for industry-defined certificates in lieu of degree programs, or structuring degree programs around a series of certificates which allow both students and employers to pursue education in a modular fashion. At least one study noted that completion of a certificate should be recognized as an education program completion by the SBCTC, and payments or other rewards provided to the colleges should recognize these completions appropriately. Internships and other forms of incorporating workplace-based components in an education program were also recommended in several studies. These innovations in service delivery should be encouraged by the SBCTC.

4. The SBCTC should make a policy commitment to direct colleges to respond to evidence of excess supply or demand by contracting or expanding the number of slots in particular programs. With overall demand for trained workers substantially in excess of supply, it is not possible to satisfy all industry demand with current funding levels. However, resources should not be allocated to programs where demand is weak or pay very low absent compelling social justifications, and occupations with huge unmet demand such as Information Technology should be expanded as rapidly as possible to maintain the credibility of the community and technical college system in the eyes of both employers and jobseekers.

5. The colleges need to conduct more outreach and marketing in some areas. The SBCTC should support such efforts and encourage non-traditional forms of marketing and outreach such as building networks to regional Workforce Investment Boards and groups representing local employers such as Chambers of Commerce and Economic Development Councils. Regular contacts should occur with employers, unions, and workforce and economic development organizations. One Oregon community college features regular "President's Breakfasts" to which local CEOs are invited. Food and networking among college faculty, administrators and local employers are accompanied by a program of interest to the employers. Such venues could also be created by Washington colleges.

6. Washington's labor market is expanding rapidly in the Puget Sound, less rapidly in other urban counties, and usually very slowly in rural counties. These patterns have typified most of the last two decades and the long term projections suggest a continuing concentration of new employment opportunities in urban areas. The colleges, however, are placed all over the state to give all state residents access to higher education. Therefore, the programs offered at colleges in rural areas will need to concentrate some of their resources on occupational fields concentrated in urban areas rather than locally.

APPENDIX

OCCUPATIONAL ASSESSMENT INTERVIEW GUIDE

EXAMPLES OF COMMUNITY/TECHNICAL COLLEGE OCCUPATIONAL ASSESSMENT REPORTS

Occupational Assessment Interview Guide

20-30 employers should be interviewed in person or by telephone, with a mix of large, medium, and small firms; this is in order to assure both breadth and depth of information in the assessment.

Introducing Study Process

Explain purpose of study and the particular occupation or set of occupation on which the study is focused. Describe the types of information sought, and how the results will be used to guide resource allocation and service delivery decisions.

Note to interviewers:
This guide is meant to be a guide to structure a conversation, not a survey form with questions that must be asked in the same order and the same wording. Feel free to let a conversation with an employer take its own course. Employers will often be intensely interested in some topics and have little to say about others. Some subjects may come up and be thoroughly covered before you have a chance to ask the question. If you have the survey guide in front of you, you can take notes as the conversation takes place and at the end, by reviewing your notes you can ensure that all topics have been covered and probe any missing areas as time permits. One way to ensure that you get all of the information you need is to set up a notebook in advance with each question at the top of a page; one can very quickly scan the notebook two thirds of the way through the interview to see how to focus the remaining time.

1. Please describe your position and how you are involved with decisions about hiring, training, or promoting people in this occupation:

2. How large is the demand for this particular occupation or set of occupations?
   Probes:
   How many openings in this field do you expect in the next month? Next year?

3. Do you expect demand to increase or decrease in the future, and why?

4. Are you having trouble getting enough qualified applicants for these jobs?
   Probes:

Is the wage level a problem?
Do applicants have problems with working conditions?
Do applicants have the required skills?

5. What is the starting wage? How does that wage progress over time? Has the wage for this occupation increased a great deal recently due to high demand?

6. What are the specific skill requirements for hiring someone into this position? What levels of the following skills are needed?

Basic skills: reading, writing, math.

Workplace skills: teamwork, communications, punctuality, responsibility.

Job-specific skills: work processes, technologies, management practices.

Are there any skills standards established by the company, industry associations, or unions for this occupation? Does the association or union have a formal certification program?

7. How do you find people for this position?
Probes:
Do you use newspaper ads?
Employment Security?
Informal networks/current employee referrals?
Temp agencies?

8. How do you screen job applicants?
Probes
What specifically do you look for in applicants?
How much weight do you give to previous work experience, in or out of the occupation, compared to specific degrees and certificates?

9. What kind of career ladder exists for someone who enters this job, both in terms of work and of wages?

10. What kinds of training do you provide people in this job?

Probes:

What kinds of outside training do you use: community/technical colleges, private providers, public jobs programs, industry or trade associations, apprenticeships?

How well are these training sources working for you?

11. What forms of training best fit this job? (open entry/exit; split week or blocks of time assigned to work and study/coop learning; on-site vs. on-campus; distance education)

12. Do you have any suggestions for the community and technical colleges who provide programs in this field?

Labor Market Study

Automotive Tech

Occupational Assessment Results

Lake Washington Technical College

Ron Wheadon, Dean of Instruction
Industrial Technology Division

Lake Washington Technical College instructors Paul Axtell and Nolan Koreski contacted twenty-one Automotive Repair businesses to obtain the information for this labor market study. They asked sixteen questions of each business. These businesses were Dealers, Independent Auto Repair Shops, Specialty shops and one employment agency.

A list of the business contacted (page 8) is attached at the end of this summary report. The responses per business per question (pages 9-44) are attached.

This report will list each question and followed with a summary of the responses of the questions from the businesses (pages 1-6). This is followed with the activities (page 6&7) Lake Washington Technical College is doing to address some of the needs identified in the labor Market Study.

Question # 1

What is the demand in the automotive field for technicians that have some post high school education? Why is that?

All respondents stated the demand is high, very high or critical. They said the demand of the technician to be trained is critical. Overall the demand is high and the technician has to be trained at a very high technical level due to the complexity of the job. This included a growth in types of automobiles they work on, need for computer skills, customer services abilities, electrical diagnostic abilities, appropriate writing, reading and computations abilities.

They stated that the education system has not meet the needs of the industry.

In summary, the respondents said there is a high demand with high technical expectations of the employee.

Question #2

Are you having trouble getting enough qualified applicants for these jobs? Why?

All respondents stated yes to this question. The reason for them to not be able to obtain qualified applicants ranged from many seasoned technicians are retiring or close to retirement to there have not been a process to replenish the supply of technicians for the demand. Another theme was that the industry has not publicized the benefits of the career. This message being that it is a high tech career with good pay and benefits. They feel that most of the youth are being drawn to the computer technology field, leaving this industry without qualified candidates.

Question #3

What kind of qualifications do most entry-level applicants seem to have?

All respondents stated the applicants had basic skills, but lacked the "high tech" skills such as electrical, customer services, and diagnostics skills. They have taken what they can get and attempted to train them themselves.

Question #4

In your opinion, what is the prevailing starting wage for an entry-level tech?

The range for all respondents was $6.50 to $ 15.00 per hour. The Dealers ranged from $ 6.50 to $12.00 per hour. The independents ranged from $8.00-15.00 per hour. The specialty shop was $ 12.00 per hour. The employment agency was $9.00 per hour.

Question #5

How does that wage progress over time for the individual:

(a) with post high school training?
(b) Without post high school training?

With post high school training the tech has much better chance to increase their wages. The tech without post high school training has less of a chance. Certifications are important and are an incentive to make more money. The tech without post high school training can go from $8.00 to $10.00. The tech with post high school training can go from $10.00 to $20.00 per hour or more.

Question # 6

What are the specific skill requirements for hiring someone into this position? Which skills are the most important for this particular job?

Three major skill areas merged with this question. They were mechanical, computer, and electrical. There was a strong need for electronic diagnostic abilities with an aptitude to be a good team member and the willingness to learn.

a. Are there any Skill Standards established for this occupation?

Automotive Services Excellence tests and Washington State Emission Certifications was mention the most, however they generally stated there were not any standards and that there need to be some established.

b. Basic skills: e.g., reading, writing, math.

The best information from the respondents was "read and comprehend schematics, calculate Ohms law, communicate in proper sentence structure; these are considered basic job requirements.

c. Workplace skills: e.g., teamwork, communications, punctuality and responsibility.

All respondents required these skills of the auto tech.

d. Job-specific skills: e.g., work processes, technologies and management practices.

Most all of the respondents consider all of these skills critical especially if the tech wanted to advance in the occupation. They did not have much confidence in the high school, community or technical colleges in training in these areas. A theme was the basic skills are a must to enter, but to advance the tech would have to have these skills. There was some mention of litigation issues that some of the respondents were experiencing due to the tech having the lack of these skills.

Question #7

Is an internship necessary?

The majority of the respondents agreed that an internship was necessary, the rest stated it would be helpful but not required. The length of the internship mentioned was from 30 days to 3 months.

Question #8

How do you find people for this position?
Asked about both formal and informal hiring practices: newspapers ads, Employment Security, informal networks/current employee referrals, temp agencies?

Approximately one half of the respondents get their techs through school to work programs with the community and technical colleges. Several use newspaper advertisements, journal ads, and job fairs and radio ads. Some give a bonus to working

personnel for recruiting a candidate. The major sources for new applicants was the community and technical colleges.

Question # 9

How do you screen people—what specifically do you look for in applicants?

A list of screening tools were:

Screening Tools	# of times mentioned
Applications	7
Drug Testing	5
Driving record checks	3
Reference	3
Interviews/scenarios	6
Certificates	3
Leadership Experiences	1
Work Experience	3
Work Attitude	6
Grade point Average	1
Credit check	1

Generally speaking they are looking for someone with a mechanical aptitude and a good attitude.

Question # 10

How much weight do you give to previous work experience, in or out of the occupation, compared to specific degrees and certificates?

The preference would be work experience. One third said they give degrees as much creditability as work experience. The majority place work experience at a higher level (60-80%) to education (20-40%).

Question # 11

What kind of career ladder exists for someone who enters this job, both in terms of work and of wages?

The career ladder opportunities in this occupation are excellent if the techs do good work, are productive, have good customer skills and are willing to get further training. Pay can progress to $20-30 per hour. Some Techs can make as much as $70,000-100,000 pre year. Wages are typically $ 38,000-$40,000 and top out at $70,000. The only time frame mentioned for accomplishing this wage was about five years of experience.

Question # 12

What kinds of training do you provide people in this job? What kind of training do you foresee as meeting your needs?

Most of the training offered is in-house training and factory training for dealership techs. The Auto Emissions training and test was another training they offered and needed. Only one respondent mentioned community and technical colleges and they did not mandate, but encouraged it.

Question #13

What kinds of outside training do you use: community/technical college, private providers, industry or trade associations, and apprenticeship level program? How well are these training sources working for you?

The dealers use outside factory training. Some use vendor specialty tool training. Three respondents mentioned that factory training at community and technical college work well.

Question # 14

What format of training best fits this job? (open entry/exit; split week or clocks of time assigned to work and study/coop learning; on-site vs. on-campus; distance education) Would you send entry-level technician to this training and pay for the training.

This was evenly split between evening course, off-site training and on-site training. Two like the six-week at school and six week at work. One liked the concurrent training or coop. Most did send their techs to training of some sort.

Question # 15

How are new forms of Information Technology computer related skills affecting your industry? Does your worker need new Information technology Computer related skills compared to 2 or 3 years ago?

Skills needed are:

Skill	# of times mentioned
Keyboarding	3
Basic Window skills	8
Vehicle Computerized systems	3
Use of laptop	2
Mitchell/computer books	3
Internet and use of CD's	6

Question #16

Have you used any community or technical College program in this area to upgrade Information Technology Computer Related skills of your workers.

Twenty respondents said no. One said yes. Twelve of the twenty-one said they would consider training.

What Lake Washington Technical College is doing to address the information from this study.

1. The Auto Repair Technician program received the NATEF Master Certification in May of 1999.

2. A partnership with four dealerships was developed. There will be eight students who will be at dealerships for the lab portion of their training and four more hours per day. They will be paid for this time. The dealerships will hold a portion of their pay for a bonus on graduation. If the student quits school they loss the employment at the dealership. We are attempting to expand this model to other dealerships, independent shops and specialty shops.

3. We have incorporated computer skills into the curriculum. The skill level is higher than what was requested in this study.

4. We need to market our program because few knew what we are doing in the program. We are doing this with a new brochure, revitalizing the Advisory committee with members that participated in the study, advertisements in the Seattle Times, on radio and television. These advertisements are generally for the entire college.

5. We have set up articulation agreements with the Auto programs at the high schools in our district to give the top students credit at the college for classes they successfully complete with a grade of B or better at the approved high school programs.

6. We are in the process of working with ITEC. This is the program that the respondents mentioned with students who work six weeks at the dealership and six weeks at school.

7. We are considering the feasibility of offering advanced Auto Tech courses in the evening and on weekends.

8. Lake Washington offers the Auto Emission class in the evening.

Green River Community College
Labor Market Study

Purchasing and Logistics Management Technology
Occupational Assessment Results

OCCUPATIONAL DEMAND

Identify Growth

This study was conducted with the warehousing and transportation industry. The employers in the warehousing industry in the South King County area that are expanding stated that they are expanding at a slow rate. Most said their business would be expanding, however due to technology, they would not be increasing their employee base. They did say there was a high turnover rate thus jobs would be available at its normal rate. From the purchasing area employers said they are not expecting growth, due to the speed of technology. Technology has decreased the demand for a high volume of employees, however those who are in the purchasing area must have computer skills.

	Business Growth	Employee Growth
Don't know	0	0
Remain same	3	9
Decrease	1	1
Increase	12	6

Employer Demand

Most employers stated they had difficulty getting and keeping good warehouse workers, drivers, and mechanics, as well as people with sufficient computer skills. They did say that once they employed someone who was good they preferred to move them up within the organization or they moved on to another organization in the same type of business. For the management areas of the business, all employers prefer to move people up within the organization or to get them from someone else. They prefer to start people in the warehouse area then move them to other areas. Employers stated it is imperative that management level employees be experienced in all phases of the business, and that it is very difficult for someone to come from school into a management position because they don't know the "ins and outs" of the business.

OCCUPATIONAL TRAITS

Job Characteristics:

Employers are looking for full time employees. Three employers said they hire students on a part-time or seasonal basis.

Starting wages run from $6.50 to $14.00 per hour. One organization has driver owners who can make as much or as little as they choose. For the entry level positions wages tend to top out after two years from $9.50 to $16.00 per hour. After the two year period there is room for advancement, however the advancement would be into another position within the organization. Often the warehouse people move into purchasing, or driving positions, and then some into management.

Entry Level Wages for full time employees

Warehouse workers	$6.50 - $14.00 per hour
Purchasing agents	$8.25 - $13.50 per hour
Drivers	$10.00 - $16.00 per hour
Mechanics	$10.50 - $12.00 per hour

Key Skill Requirements
(Not all organizations stated they look for the skills listed below, however all stated that in order to move up within the organization a person must have these skills.)

	Number of organizations wanting employees to have entry level skills in these areas prior to hire
Basic Math Skills to include reading a simple chart	10
Math skills to include formulas	6
Reading, to include load charts/addresses	9
Reading, to include technical manuals and vendor info	7
Writing to include letters and memo's	10
Computer Skills	16
Willing and able to learn	16
Customer service	16
Workplace skills	16

Math skills; being able to visually count accurately, reading a scale, calculations including algebra, the ability to compute formulas, and the ability to read simple charts and graphs.

Reading skills; ability to read an address and the ability to read load charts and to coordinate the two, read catalogues and technical manuals, as well as vendor information.

Writing skills; include the ability to input data into a computer accurately and to write letters and memo's to vendors and customers.

Computer skills; all organizations stated that computer skills are a must. Basic typing and window based office applications are a must if people want to move up in the organization. Many of the organizations are looking at the possibility of e-commerce.

Work processes; are taught on the job and are generally site specific. Employers want people who are willing and able to learn their specific system. Employers did say people must be detailed oriented, and be able to work independently and together to get the job done. All stated a specific ability to lift from 40 to 65 lbs.

Customer Service Skills; all employers stated they want people who have the ability to deal with all customers in a courteous and efficient manner.

CAREER LADDERS

All employers prefer to hire from within. Typical examples of career ladders include:

(1) Warehouse worker to warehouse supervisor to manager, or warehouse worker to driver to dispatcher.
(2) Warehouse worker to driver to field rep. to field engineer to sr. field engineer, to corporate office. (In this example, a technical degree is preferred once people move into the field engineer positions -- a field engineer is the logistics person.
(3) Warehouse to sales trainee to sr. sales or moving from warehouse to service and dispatching. (a sales trainee is someone who coordinates all sales from the sr. sales person and follows the product through to the customer).

Recruiting/Screening/Hiring Practices	
Recruit from within	16
Word of mouth	16
Job fairs	3
Newspaper	8
Post at Community Colleges	4
ESD	1
Temp agencies	0

All employers recruit from within their organization first and all use employee referrals. Some pay incentives to current employees for referrals if the new employee stays more than 90 days. Some employers attend job fairs, use newspaper ads and post at community colleges. Only one organization stated that they posted with ESD and those who have used temporary agencies in the past are no longer using them.

When hiring specific screening requirements include:	
A gut feeling	8
A gut feeling and previous work history	13
Previous work history	16
Some college experience	3

College degree	1
Specific certificates	2
Testing (math)	2

All employers stated that previous work history was important. Three stated that they look for people with some college experience, not necessarily a degree. In fact, several stated they shy away from people with a degree. One stated a degree was critical. Employers like people who can complete a job application neatly and prefer those who have a resume. Computer skills are a plus for all applicants and necessary for most applicants. Employers look for people they believe they can train and several stated this was done more by feel than anything else. Several stated they would like to see more women apply for all positions. No one in the warehousing area looks for an applicant with any certification other than forklift training, and that is usually done on the job. For some driver positions, CDL and HazMat Certifications are required. Some warehouse positions also require HazMat certifications but those are offered once employed not required prior to employment. Employers doing international trade look for people with degrees and experience, or experience and certifications. A degree alone does not get anyone in the door.

Interviews are conducted by supervisors and then usually someone from personnel or management. All but one employer does two interviews prior to a background check. All employers do a background check and one does drug screening.

TRAINING NEEDS

Employer provided training on site:	
Forklift	7
Safety	16
Process	16
Product specific	2
Driving	2

Employer provided training off site:	
Product specific	2
Management	2
Tuition reimbursement	1

Outside training sources	
Consultants	1
Community College	1
Product specific	2

All employers, but one, who use forklifts offer that training on site. This employer sends employees out to get the certification for the forklift. All employers have mandatory safety training. This includes proper lifting techniques. Several employers send their

employees out for PC training, others do this in house. All employers conduct process training in-house. Two employers send employees to product specific training. Two employers have employee ride along training prior to being let loose on their own. Two employers send people to company specific management training and two to company specific mechanical training. One employer has used consultants for management training and one employer is looking for CNC training for employees. Lastly, one employer has tuition reimbursement available to all employees. However, only one person in the past five years has used this benefit.

SUMMARY ANALYSIS

From the outset, it is obvious that many of the employers in the Kent Valley area do not know enough about Green River Community College and the services and education/training that the college provides. It is clear that they do not look to the college as their first choice in providing training and they do not look to the college when recruiting employees. This should be of concern for the college. This means that we need to do a better job of being visible to all employers in our region and that we need to take a more proactive stance in workforce and economic development.

That observation aside, the data does provide the college with useful information with regards to future education and training programs. As expected, if employers were aware of the opportunities at GRCC, they would access them if these were offered during nontraditional hours (after 4pm and on the weekends). This conclusion comes from the overwhelming response that most employers promote from within. The data also clearly showed that a degree was not critical, rather skill attainment was most important to employers and employees. Thus, if the college chooses to revitalize the Transportation program, it should do so with three issues in mind. In addition, the college should consider changing the name of the program to Logistics Management.

1. All courses are offered in the evening and on weekends. Distance education wherever possible would also be a viable option.
2. The program should be redesigned utilizing the skills standards developed by the National Transportation Board and should be modularized to include short-term certificates that prepare learners for NTB certifications: Hazardous Materials Handling, Tariff Laws and International Trade, etc.
3. Customer Service skills must be emphasized throughout the curriculum.

With regards to Purchasing Management, it seems that there is a need for a program in this area. Again, because most employers promote from within, the program must be offered in nontraditional hours. And as with Logistics Management, customer service skills must be emphasized and the curriculum should be modularized. Employers are more likely to send their employees to short-term training programs than they are for a degree. So a program in which the student can attain a series of certificates that when added up equal a degree is more likely to be successful than a traditional associates degree program.